

ABSTRACT OF THE INVENTION

A new superfamily of protein kinases has been discovered that centers around eukaryotic elongation factor-2 kinase (eEF-2 kinase). The protein kinases of this new superfamily have the following characteristics: 1) sequence similarity to eEF-2 kinase; 2) no sequence similarity to the protein kinases of either the serine/threonine/tyrosine kinase or histidine kinase superfamily; and, 3) specifically phosphorylates α -helical regions of proteins as opposed to β -turns, as seen in all other protein kinases. Assays have been developed utilizing eEF-2 kinase and a phosphorylation target consisting of a novel α -helical 16-amino acid peptide sequence to facilitate high-throughput screening for compounds that can specifically inhibit this protein kinase that has been implicated tumor growth and other hyperproliferative disorders. Additionally, the disclosed invention includes assessing eEF-2 kinase levels for diagnostic purposes, and therapeutic formulations to inhibit eEF-2 kinase activity.